I. Amendments

A. Amendments to the Claims

Listing of the Claims

This listing of claims replaces all prior versions and listings of claims in the application:

Please amend claims 21 and 34 as follows:

1-20 (cancelled)

21. (currently amended) A method for determining a first distance along a movement path on a surface over which an optical tracking device is moved by a user, comprising:

projecting, from a coherent light source, and along the movement path, a beam of coherent light as a first light beam incident on the surface;

generating, on the surface and along the movement path, a plurality of light interference speckles resulting from the first light beam and a second light beam representing at least portions of the first light beam reflected from the surface interfering with one another, the speckles having at least a first average spatial dimension;

sensing the plurality of speckles with a plurality of light sensors arranged in ~~an areal pattern~~ a sensor cluster as the optical tracking device is moved along the movement path, each of the light sensors having a second spatial dimension that is less than the first average spatial dimension of the speckles, each of the light sensors further being configured to generate a first signal when one of the plurality of speckles is disposed therebeneath and detected thereby and to generate a second signal when one of the plurality of speckles is not disposed therebeneath and not detected thereby, and

determining, on the basis of the plurality of first and second signals, the first distance.

22. (previously presented) The method of claim 21, further comprising determining, on the basis of the first and second signals generated by the plurality of light sensors as the device is moved over the surface , a direction in which the optical tracking device moves along the movement path.

23. (previously presented) The method of claim 21, further comprising comparing the plurality of first and second signals to determine the first distance.

24. (previously presented) The method of claim 21, further comprising comparing the plurality of first and second signals to determine a direction in which the optical tracking device moves along the movement path.

25. (previously presented) The method of claim 21, further comprising sensing at least one characteristic of the speckles.

26. (previously presented) The method of claim 25, wherein the at least one characteristic is selected from the group consisting of speckle length, speckle width, speckle dimension, an edge of a speckle, a distance between speckles, a distance between leading edges of speckles, and a distance between trailing edges of speckles.

27. (previously presented) The method of claim 21, further comprising configuring the coherent light source and the plurality of light sensors such that the first average spatial dimensionof the speckles may be predicted with a high degree of confidence.

28. (previously presented) The method of claim 21, further comprising configuring the coherent light source and the plurality of light sensors such that the first average spatial dimension of the speckles is given approximately by the equation:

$$\lambda \cdot (R/d),$$

where λ is a wavelength of the light emitted by the coherent light source, R is a second distance the coherent light source is from the surface, and d is a diameter of the coherent light beam.

29. (previously presented) The method of claim 21, further comprising counting the number of speckles along the optical path to determine the first distance.

30. (previously presented) The method of claim 21, wherein the first average spatial dimension of the speckles is selected form the group consisting of about 10 microns and ranging between about 50 microns and about 100 microns.

31. (previously presented) The method of claim 21, wherein the plurality of light sensors comprises at least five light sensors.

32. (previously presented) The method of claim 21, wherein the first signal is a high signal and the second signal is a low signal.

33. (previously presented) The method of claim 21, wherein the second signal is a high signal and the first signal is a low signal.

34. (currently amended) A device for determining a first distance along a movement path on a surface over which an optical tracking device is moved by a user, comprising:

a coherent light source configured to project a first coherent light beam along the movement path and onto the surface as an incident light beam, the coherent light source being configured in respect of the surface to produce a plurality of light interference speckles resulting from the first light beam and a second light representing at least portions of the first light beam reflected form the surface interfering with one another, the speckles having a first average spatial dimension;

a plurality of light sensors arranged in ~~an areal pattern~~ a sensor cluster and operatively associated with the coherent light source and the processor, each of the plurality of light sensors having a second spatial dimension that is less than the first average spatial dimension of the speckles, each of the light sensors further being configured to generate a first signal when one of the plurality of speckles is detected thereby and to generate a second signal when one of the plurality of speckles is not detected thereby, and

a processor configured to determine the first distance on the basis of the plurality of first and second signals generated by the plurality of light sensors as the device is moved over the surface.

35. (previously presented) The device of claim 34, wherein the processor is further configured to determine, on the basis of the plurality of first and second signals generated by the plurality of light sensors as the device is moved over the surface, a direction in which the optical tracking device moves along the movement path.

36. (previously presented) The device of claim 34, wherein the processor is further configured to compare the plurality of first and second output signals to determine at least one of the first distance and a first direction.

37. (previously presented) The device of claim 34, wherein the processor is further configured to determine at least one characteristic of the speckles.

38. (previously presented) The device of claim37, wherein the at least one characteristic is selected from the group consisting of speckle length, speckle width, speckle dimensions, an edge of a speckle, distance between speckles, distance between leading edges of speckles, and distance between trailing edges of speckles.

39. (previously presented) The device of claim 34, wherein the coherent light source and the plurality of sensors are configured such that the first average spatial dimension of the speckles may be predicted with a high degree of confidence.

40. (previously presented) The device of claim 34, wherein the coherent light source and the plurality of sensors are configured such that the first average speckle dimension is given approximately by the equation:

$$\lambda \cdot (R/d),$$

where λ is a wavelength of the light emitted by the coherent light source, R is a second distance the coherent light source is from the surface, and d is a diameter of the coherent light beam.

41. (previously presented) The device of claim 34, wherein the processor is further configured to count the number of speckles along the optical path to determine the first distance.

42. (previously presented) The device of claim 34, wherein the first average spatial dimension of the speckles is selected from the group consisting of about 10 microns and ranging between about 50 microns and about 100 microns.

43. (previously presented) The device of claim 34, wherein the plurality of light sensors comprises at least five light sensors.

44. (previously presented) The device of claim 34, wherein the first signal is a high signal and the second signal is a low signal.

45. (previously presented) The device of claim 34, wherein the second signal is a high signal and the first signal is a low signal.

46. (previously presented) The device of claim 34, wherein the processor is further configured to detect leading edges of the plurality of first and second signals generated by the plurality of light sensors.

47. (previously presented) The device of claim 34, wherein the processor is further configured to detect trailing edges of the plurality of first and second signals generated by the plurality of light sensors.

48. (previously presented) The device of claim 34, wherein the first average spatial dimension of the speckles is at least twice that of the second spatial dimension of the sensors.

49. (previously presented) The device of claim 34, wherein the device is a mouse.

50. (previously presented) The method of claim 21, wherein the first average spatial dimension of the speckles is at least twice that of the second spatial dimension of the sensors.